## **CLAIMS**

What is claimed is:

1. (Currently amended) A nucleic acid sequence which comprises comprising:

 $P_x-S_x-B_n-(ZR)$ -transport peptide- $(Z_1Z_2)$ -protein(Y)-T; wherein:

the nucleic acid codes for a fusion protein comprising a peptide encoded by transport peptide linked via a peptide encoded by a first  $Z_1Z_2$  to a protein encoded by said protein(Y) which is linked to T;

the peptide encoded by transport peptide improves the rate of secretion of the protein encoded by said protein(Y);

P<sub>x</sub> comprises a promoter sequence;

S<sub>x</sub> comprises a nucleic acid sequence encoding a signal or leader sequence;

B<sub>n</sub> is a chemical bond;

Z is a codon for lysine or arginine;

R is an arginine codon;

transport peptide comprises a nucleic acid sequence encoding hirudin <u>or an hirudin</u> <u>variant;</u>

 $Z_1$  is a codon for lysine or arginine or a portion thereof or a chemical bond when  $Z_1$  and  $Z_2$  combine to make the second  $Z_1Z_2$  and m =0;

 $Z_2$  is a codon for lysine or arginine or a portion thereof or a chemical bond when  $Z_1$  and  $Z_2$  combine to make the second  $Z_1Z_2$  and m=0;

protein(Y), selected from the group consisting of mini-proinsulin and proinsulin, comprises a nucleic acid sequence encoding a protein, selected from the group consisting of mini-proinsulin and proinsulin, that is produced and secreted by yeast; and

T is an untranslated expression-enhancing nucleic acid sequence.

## Claims 2 - 5. (Canceled)

- 6. (Original) A multicopy vector comprising the nucleic acid of claim 1.
- 7. (Original) A plasmid comprising the nucleic acid of claim 1.
- 8. (Original) A host cell comprising the nucleic acid of claim 1 as a part of the host cell chromosome, as a part of a mini-chromosome, or extra-chromosomally.
- 9. (Original) The host cell of claim 8, wherein the host cell is a yeast.
- 10. (Original) The host cell of 9, wherein the yeast is selected from *Saccharomyces cerevisiae*, *Kluyveromyces factis*, *Hansenula polymorpha*, and *Pichia pastoris*.
- 11. (Original) A host cell comprising the multicopy vector of claim 6.
- 12. (Original) A host cell comprising the plasmid of claim 7.

Claims 13-26. (Canceled)

- 27. (Previously presented) An engineered host cell comprising the nucleic acid of claim 1 as a part of the host cell chromosome, as a part of a mini-chromosome, or extra-chromosomally.
- 28. (Previously presented) An engineered host cell comprising the multicopy vector of claim 6.
- 29. (Previously presented) An engineered host cell comprising the plasmid of claim 7.
- 30. (New) An article of manufacture comprising a nucleic acid sequence which comprises:

 $P_x-S_x-B_n-(ZR)$ -transport peptide- $(Z_1Z_2)$ -protein(Y)-T; wherein:

the nucleic acid codes for a fusion protein comprising a peptide encoded by transport peptide linked via a peptide encoded by a first  $Z_1Z_2$  to a protein encoded by said protein(Y) which is linked to T;

the peptide encoded by transport peptide improves the rate of secretion of the protein encoded by said protein(Y);

P<sub>x</sub> comprises a promoter sequence;

S<sub>x</sub> comprises a nucleic acid sequence encoding a signal or leader sequence;

 $B_n$  is a chemical bond;

Z is a codon for lysine or arginine;

R is an arginine codon;

transport peptide comprises a nucleic acid sequence encoding hirudin or an hirudin variant;

 $Z_1$  is a codon for lysine or arginine or a portion thereof or a chemical bond when  $Z_1$  and  $Z_2$  combine to make the second  $Z_1Z_2$  and m = 0;

 $Z_2$  is a codon for lysine or arginine or a portion thereof or a chemical bond when  $Z_1$  and  $Z_2$  combine to make the second  $Z_1Z_2$  and m = 0;

protein(Y) comprises a nucleic acid sequence encoding a protein, selected from the group consisting of mini-proinsulin and proinsulin, that is produced and secreted by yeast; and

T is an untranslated expression-enhancing nucleic acid sequence.

- 31. (New) A multicopy vector comprising the nucleic acid of claim 30.
- 32. (New) A plasmid comprising the nucleic acid of claim 30.
- 33. (New) A host cell comprising the nucleic acid of claim 30 as a part of the host cell chromosome, as a part of a mini-chromosome, or extra-chromosomally.
- 34. (New) The host cell of claim 33, wherein the host cell is a yeast.
- 35. (New) The host cell of 34, wherein the yeast is selected from *Saccharomyces cerevisiae*, *Kluyveromyces factis*, *Hansenula polymorpha*, and *Pichia pastoris*.

- 36. (New) A host cell comprising the multicopy vector of claim 31.
- 37. (New) A host cell comprising the plasmid of claim 32.